

Amendments to the Claims

The following listing of claims will replace all prior versions, and listing, of claims in the application:

1. (currently amended) A p[[P]]ointing apparatus for [[the]] correct positioning of [[the]] distal locking screws of an intramedullary nail comprising a hole, the pointing apparatus comprising characterised in that it includes:

[[·]] means for receiving designed to receive one or more images of [[the]] a section portion of the nail to be fixed with the screws , the one or more images showing the hole ;

[[·]] means for processing designed to process the one or more images to obtain [[the]] coordinates of the centre of the hole and [[the]] inclination of [[the]] an axis of the hole; and

[[·]] means for positioning designed to position an instrument in correspondence with said the axis, and align the said instrument with the said axis.

2. (currently amended) The p[[P]]ointing apparatus as claimed in claim 1, further comprising characterised in that it includes:

[[·]] a head which includes a reference designed to be viewed by an external viewing apparatus X-ray, fluoroscopic or similar apparatus, and means [[of]] for guiding a surgical instrument;

[[·]] means for moving designed to move said head close to [[the]] an end of the nail containing the hole[[s]], to allow said external viewing apparatus to take simultaneous an image[[s]] of the end of the nail with containing the hole[[s]] and of the reference integral with the terminal;

[[·]] means for reading designed to read [[said]] the image and calculate [[the]] position and inclination of [[its]] the axis based on the basis of the shape and dimensions of the hole shown in the image;

[[·]] means for reading designed to read the image of said reference and calculate [[the]] relative position and inclination of [[said]] the reference, and consequently of [[said]] the head, based on the basis of the shape and dimensions of [[said]] the reference [[.]] ; and

[[·]] means for calculating designed to calculate [[the]] position and relative inclination of the axis of the hole in relation to said relative to the reference and to move [[said]] the head so as to bring provide [[said]] the means for guiding the surgical instrument guidance means into axis with said hole, with an inclination same as the same inclination [[as]] of the axis of the hole.

3. (currently amended) The p[[P]]ointing apparatus as claimed in claim 1, further comprising characterised in that it includes:

[[·]] a reference system designed to be viewed by an external X-ray, fluoroscopic or other type of apparatus;

[[·]] a pointing system which contains a housing for a quick release coupling of a terminal designed to support surgical instrument guidance means (such as a cannula);

[[·]] a terminal, fitted with surgical instrument guidance means, which is the terminal designed to receive the pointing system via a quick [[-]] release coupling associated with the housing;

[[·]] means for moving designed to move [[said]] the terminal close to [[the]] an end of the nail containing the hole[[s]], to allow said external apparatus to take simultaneous an image[[s]] of the end of the nail with containing the hole[[s]] and of [[the]] a reference integral with the terminal;

[[·]] means for reading designed to read [[said]] the image and calculate [[the]] position and inclination of [[its]] the axis based on the basis of the shape and dimensions of the hole shown in the image;

[[·]] means for reading designed to read the image of said reference system and calculate [[the]] relative position and inclination of [[said]] the reference system, and consequently of [[said]] the terminal, based on the basis of the shape and dimensions of the reference said system; and

[[·]] means for calculating designed to calculate [[the]] position and relative inclination of the axis of the hole in relation relative to at least one between [[said]] the reference and the and/or pointing system and to move [[said]] the terminal so as to bring said provide the surgical instrument guidance means with an inclination same as into the axis of said hole, with the same inclination [[as]] of the axis of the hole.

4. (currently amended) The p[[P]]ointing and/or reference apparatus as claimed in claim 2 [[or 3]], wherein [[said]] the means for reading comprise designed to read the image taken by said external apparatus are constituted by a sensor connected via an interface to [[the]] an output of [[said]] the external X-ray, fluoroscopic or other apparatus.

5. (currently amended) The p[[P]]ointing and/or reference apparatus as claimed in claim 2, wherein characterised in that the reference system is integral with the head and is constituted by comprises one or more radiopaque bodies of known shape, dimensions and position, incorporated in [[said]] the head.

6. (currently amended) The p[[P]]ointing and/or reference apparatus as claimed in claim 3, wherein the reference system is separate from the terminal and [[said]] the terminal is designed to be connected connectable to the reference system via a quick [[-]] release coupling and is fitted with means for guiding designed to guide a surgical instrument (such as a cannula), in a known position in relation relative to at least one between the reference system and the and/or pointing system.

7. (currently amended) The p[[P]]ointing apparatus as claimed in claim 2 one or more of the preceding claims, characterised in that wherein the reference comprises is constituted by a plurality of radiopaque elements of known shape, dimensions and position.

8. (currently amended) The p[[P]]ointing apparatus as claimed in claim 7 one or more of the preceding claims, characterised in that said wherein the radiopaque elements are spheres with a known shape, dimensions and position.

9. (currently amended) The p[[P]]ointing apparatus as claimed in claim 7 one or more of the preceding claims, characterised in that said wherein the radiopaque elements or spheres are located at [[the]] vertices of polygons of known dimensions.

10. (currently amended) ~~The p[[P]]ointing apparatus as claimed in claim 3 any of the preceding claims, characterised in that wherein the head or terminal and the reference system are mounted on a support comprising a plurality of numerically controlled actuators designed to control translation their movements of the terminal and the reference system according to at least two linear directions orthogonal to one another, and to control their rotation of the terminal and the reference system around at least two non-parallel axes.~~

11. (currently amended) ~~The p[[P]]ointing apparatus as claimed in claim 2 any of the preceding claims, characterised in that it includes further comprising a sterile hood, fitted to [[said]] the head or terminal, which is the sterile hood designed to cover [[the]] supports and any other parts which come coming into contact with [[the]] an operating field of the pointing apparatus.~~

12. (currently amended) ~~A p[[P]]ointing apparatus for [[the]] correct positioning of [[the]] distal locking screws of an intramedullary nail, the pointing apparatus comprising characterised in that it includes:~~

~~[[·]] a support which can able to be positioned proximally in proximity to an operating table;
[[·]] a first movement moving system, mounted on [[said]] the support, which is subject to [[the]] action of numerical control means that control [[its]] movement[[s]] of the first moving system , under numerical control, along a first axis;~~

~~[[·]] a second movement moving system, mounted on [[said]] the first movement moving system, which is subject to [[the]] action of numerical control means that control [[its]] movement[[s]] of the second moving system , under numerical control, along a second axis;~~

~~[[·]] a reference and/or pointing system made of radiopaque material wherein the comprising spheres [[are]] arranged in such a way that they are not to be superimposed with the intramedullary nail in the X-ray, fluoroscopic or other images taken by an external apparatus associated with the pointing apparatus, thus facilitating correct framing of the spheres and [[the]] target holes in the intramedullary nail;~~

[[·]] means provided with a quick [[-]] release coupling system for fitting to the reference and/or pointing system [[10a]] and suitably shaped to allow [[the]] fitting of a surgical instrument guide cannula 13;

[[·]] means designed to receive [[in]] an input an X-ray, fluoroscopic or other image file from the external apparatus wherein [[the]] images of [[the]] an end of the nail with [[the]] a hole[[s]] for the distal locking screws and [[said]] the reference are taken simultaneously;

[[·]] processing means designed to process [[said]] the images of the end of the nail with the hole and of the reference and consequently calculate [[the]] coordinates and inclination of [[the]] an axis of the hole in relation relative to [[said]] the reference, and to automatically calculate [[the]] a length of [[the]] a screw;

[[·]] activation means designed to activate the actuators of the first moving system and second moving system slides in embodiment 1 or the upright and arm in embodiment 2 and the actuators of said supports, to move the align the surgical instrument guide on the terminal into axis with the hole in the nail.

13. (new) The pointing apparatus as claimed in claim 3, wherein the external apparatus is chosen from a group consisting of an X-ray apparatus and a fluoroscopic apparatus.

14. (new) The pointing apparatus as claimed in claim 3, wherein the surgical instrument guidance means comprise a cannula.

15. (new) The pointing apparatus as claimed in claim 3 , wherein the means for reading comprise a sensor connected via an interface to an output of the external apparatus.

16. (new) The pointing apparatus as claimed in claim 3, wherein the means for guiding a surgical instrument comprise a cannula.

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17. (new) The pointing apparatus of claim 12, wherein the external apparatus is chosen from a group consisting of an X-ray apparatus and a fluoroscopic apparatus.